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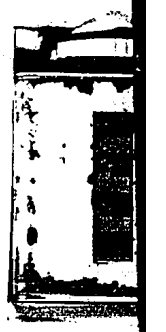

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USSR Progress in Microbiology and Virology During 1951-1953

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[Comment: The following excerpt is a part of a report presented by Nesterov at the 8th Session of the Academy of Medical Sciences USSR, Moscow, 8-11 December 1953.]

During recent years great progress has been achieved by the institutes of the Academy of Medical Sciences which work in the fields of microbiology and virology. For the first time in the history of medicine, work on the most important problems of infection and immunity was raised by USSR science to a level that corresponds to the contemporary status of knowledge in the fields of general physiology and biology. Problems of infection are now being investigated from the standpoint of the materialistic Pavlovian physiology and of Michurinist biology. The general laws of the regulation of vital functions of the central nervous system, which have been discovered by I. P. Pavlov, are reflected in the understanding of the relationships that cover the development of the infections, and the course of the processes of immunogenesis and recovery. This fact, which is still insignificant as far as actual results are concerned, is of immense theoretical significance. As the materialistic approach developed, the ideological level of Soviet microbiology, virology, and immunology was raised significantly above the level of foreign science in this field.

The problem of the modification of microorganisms, as is well-known, served as the subject of a discussion at the expanded session of the presidium of the Academy of Medical Sciences USSR in 1951.

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In a report given by V. E. Timakov, active member of the Academy of Medical Sciences USSR, it was shown that modification of the species characteristics of microbes takes place as a result of changes in the type of metabolism and proceeds against the background of a weakened heredity. As a result, formation of new species takes place. For instance, Bacilli coli can be transformed into paratyphoid bacilli and, furthermore, a new strain of the tuberculosis bacilli can be obtained or a new strain of the virus of vaccinia (M. A. Morozov).

In the course of work on the problem of intestinal infections and their prevention, a method for the many-sided immunochemotherapy of chronic dysentery has passed clinical tests and was approved by the Ministry of Public Health USSR for clinical application. This method was developed by V. L. Troitskiy, Corresponding Member of the Academy of Medical Sciences USSR. The work on the evaluation of the comparative effectiveness of antibiotics in dysentery deserves attention. This work was carried out by G. P. Rudnev, Corresponding Member of the Academy of Medical Sciences USSR, and A. F. Bilibin, Corresponding Member of the Academy of Medical Sciences USSR.

In the field of control of acute children's infections and the prophylaxis of the organism [sic], a method for obtaining a purified adsorbed diphtheria anatoxin was developed by P. V. Pavlov and A. I. Oponashchenko. Furthermore, an experimental "model" of rheumatic fever was devised.

In the field of rickettsioses, a series of investigations was completed. The investigations were summarized in the monograph "Theory of Rickettsiae and Rickettsioses," by P. F. Zdrodovskiy and Ye. M. Golinevich, published by Medgiz in 1953.

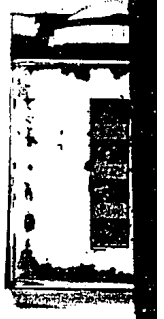
Soviet parasitologists (Academician A. N. Pavlovskiy; P. A. Petrishchev, Corresponding Member of the Academy of Medical Sciences USSR, and others), who applied the theory to the effect that human diseases are spread from natural reservoirs, achieved success in the study of cardinal problems of parasitology and in the development of effective prophylactic measures as well as in the creation of a plan for the elimination of individual infectious diseases. As far as the ideological level and the practical results achieved with reference to a number of infections are concerned, Soviet parasitology has outdistanced foreign parasitology.

During the past 2 years the Institute of Infectious Diseases has been reinforced from the standpoint of scientific accomplishment. Bogdanov, director of the institute, has invested much labor and persistence in the selection of personnel, the organization of scientific work, and other activities. During recent years, the degree of coordination between the work done by our microbiological and virological institutes, and the demands made by practical medicine has increased.

The Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR has achieved great progress in the development of a new, more perfect method for the production of vaccines and sera. The director of this institute is V. D. Timakov, Active Member of the Academy of Medical Sciences USSR. The originators of this method have been awarded a Stalin prize.

New live antibrucellosis vaccines have been obtained. Technological methods for the mass production of dry, living vaccines (an antitularemia vaccine, etc.) were developed. A new smallpox vaccine, which has a higher titer than the one used hitherto, was introduced into practical use.

The work, which had been completed as a rule, resulted in the practical application of new preparations or the compilation of new instructions and



directions pertaining to methods of the application of such preparations. The wide application of prophylactic bacterial preparations reinforces the complex of prophylactic measures carried out in the USSR.

As a result of a discussion, Soviet virologists have subjected to critical evaluation and rejected as invalid some concepts advanced by foreign scientists (Burnet, Crofton) and by USSR scientists (Bosh'yan, Utenkov, and Berulava), who advanced certain theories on the nature of the modification of viruses.

A USSR classification of the influenza viruses has been formulated on an evolutionary basis. Problems of the modification of the viruses producing influenza, encephalitis, measles, rabies, and other diseases are being investigated successfully.

Investigations of the pathogenesis and immunity in virus infections are being evaluated from the standpoint of Pavlov's theory.

In the field of biochemistry, the question has been raised for the first time as to the energy aspects of the multiplication of viruses. The investigations on the problem involved established that the synthesis of viruses is subject to the general law governing the synthesis of all living matter, in which adenosinetriphosphoric acid serves as the source of energy.

Biochemical investigations have demonstrated that viruses in the process of their multiplication in the organism consume an insignificant quantity of nutrient substances and that the pathogenecity of viruses is not based on this factor, but rather on the toxic action which the viruses exert on many types of metabolism affecting the whole organism. They exert this action by affecting the central nervous system, which participates in bringing about the disturbances that result. One may note with satisfaction that work on the problems mentioned is being conducted by Soviet virologists at a much higher level than that which is prevalent abroad.

On the basis of work carried out by Soviet virologists, including that done by workers at the Institute of Virology, Academy of Medical Sciences USSR, the director of which is M. P. Chumakov, Corresponding Member of the Academy of Medical Sciences USSR, the following new results which are of importance from the practical standpoint have been obtained: (1) the effectiveness of the live anti-influenza vaccine has been established, and its production has been organized so that enough vaccine will be produced to assure the inoculation of one million persons during 1954; (2) the method of producing the anti-influenza serum has been perfected and the production of this serum is being developed; (3) a live antipapataci fever vaccine has been developed and tested epidemiologically, on a large scale, with positive results; (4) new perfected prophylactic preparations for use against tick encephalitis and Japanese encephalitis have been developed; and (5) a new method of treating trachoma by means of a syntomycin emulsion has been developed and introduced into practical use on an extensive scale. A number of other scientific investigations have also led to practical, useful results. On the other hand, some very important and urgent problems pertaining to the control of infectious diseases have not been solved. By reason of the inadequate investigation of the antigenic nature of microorganisms, toxins, vaccines, and as a result of other shortcomings, the work on the problem of the creation of highly effective prophylactic bacterial preparations for the control of measles, scarlet fever, and whooping cough does not proceed rapidly enough. In order to eliminate the lag between scientific work and the demands of practical medicine, it is necessary to continue without interruption the search for new and improved preparations for the prophylaxis and therapy of influenza. The problem of dysentery has not received a satisfactory solution in many respects, although research in this field is being conducted by a great number of special institutes, scientists, and organizational workers in the field of public health.

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Physicians do not yet have simple and reliable methods for the diagnosis of influenza on a mass laboratory scale. Satisfactory methods for the treatment of infectious hepatitis are not yet available. During the past decade microbiologists and virologists have diligently studied the problems of the etiology, prophylaxis, and therapy of virus encephalites. This group of diseases is made significant by the fact that there are tens of thousands of incidences of diseases belonging to it. Furthermore, our scientists neglect the problems of etiology, prophylaxis, and therapy of rheumatic fever, a disease which affects many children.

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